

Appl. No. 09/913,418  
Amdl. Dated March 18, 2005  
Reply to Office Action of December 16, 2004

Docket No. CM00565P  
Customer No.. 22917

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (original) A frequency tracking loop for a digital radio communications system, said frequency tracking loop comprising:

(i) a means for correcting frequency offset, said means for correcting frequency offset receiving an input radio signal comprising bursts of known data at a first input, and supplying an output signal;

(ii) a frequency offset estimator, supplied with said output signal from said means for correcting frequency offset, for providing an estimate of a frequency offset of said output signal;

(iii) a variable bandwidth filter, supplied with said estimate of the frequency offset from said frequency offset estimator, for providing a filtered signal;

(iv) a signal generator, supplied with said filtered signal from said variable bandwidth filter, for generating an output signal with a frequency dependent on said filtered signal, said output signal from said signal generator being supplied to a second input of said means for correcting frequency offset,

wherein said frequency tracking loop is adapted to change a bandwidth of said variable bandwidth filter in dependence on at least one characteristic of the currently received burst of known data.

2. (original) A frequency tracking loop in accordance with claim 1, wherein said means for correcting frequency offset comprise a mixer or a complex multiplier, and said signal generator comprises an oscillator.

3. (original) A frequency tracking loop in accordance with claim 1, wherein said frequency tracking loop is adapted to change said bandwidth of said variable bandwidth filter in dependence on a length of said currently received burst of known data.

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4. (currently amended) A frequency tracking loop in accordance with claim 1, wherein said frequency tracking loop is adapted to provide said variable bandwidth filter with a ~~relatively~~ wide bandwidth on receiving a ~~long~~ burst of known data having a first length, and to provide said variable bandwidth filter with a ~~relatively~~ narrow bandwidth on receiving a ~~short~~ burst of known data having a second length that is shorter than the first length.

5. (original) A frequency tracking loop in accordance with claim 1, wherein said frequency tracking loop is adapted to provide said variable bandwidth filter with a bandwidth proportional to a length of said currently received burst of known data.

6. (original) A frequency tracking loop in accordance with claim 1, wherein said bursts of known data comprise one or more synchronisation bursts and one or more normal bursts, said frequency tracking loop being adapted to provide said variable bandwidth filter with a larger bandwidth for a synchronisation burst than for a normal burst, said bandwidth for said synchronisation burst being larger than that for said normal burst by a factor equal to a ratio of a number of symbols in said synchronisation and normal bursts.

7. (original) A frequency tracking loop in accordance with claim 1, further comprising means for:  
(i) determining a type of burst of known data received in a slot of an input radio signal;  
and  
(ii) supplying a signal to said variable bandwidth filter identifying said type of burst of known data.

8. (original) A frequency tracking loop in accordance with claim 1, further comprising means for:  
(i) determining said type of burst of known data and a number of symbols making up said burst of known data; and  
(ii) supplying a control signal to said variable bandwidth filter setting said bandwidth of said filter in dependence on said number of symbols.

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9. (original) A receiver for a digital radio communications system, said receiver comprising a frequency tracking loop in accordance with claim 1.

10. (original) A mobile- or a portable radio, or a mobile telephone, comprising a receiver in accordance with claim 9.

11. (original) A method of frequency tracking for a digital radio communications system, said method of frequency tracking comprising:

(i) in a means for correcting frequency offset, receiving an input radio signal comprising bursts of known data;

(ii) estimating said frequency offset of said output signal from said means for correcting frequency offset, to provide an estimate of frequency offset;

(iii) filtering said estimate of frequency offset with a variable filtering bandwidth, to provide a filtered signal;

(iv) generating a signal having a frequency dependent on said filtered signal, to provide a generated signal;

(v) correcting said frequency of said input radio signal in said means for correcting frequency offset, using said generated signal;

wherein said variable filtering bandwidth depends on at least one characteristic of a currently received burst of known data.

12. (original) A method of frequency tracking in accordance with claim 11, further comprising changing a bandwidth of said variable bandwidth filtering in dependence on a length of said currently received burst of known data.

13. (currently amended) A method of frequency tracking in accordance with claim 11, further comprising providing variable bandwidth filtering with a ~~relatively~~ wide bandwidth on receiving a ~~long~~ burst of known data having a first length, and providing variable bandwidth filtering with a ~~relatively~~ narrow bandwidth on receiving a ~~short~~ burst of known data having a second length that is shorter than the first length.

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14. (original) A method of frequency tracking in accordance with claim 11, further comprising providing said variable bandwidth filter with a bandwidth proportional to a length of said currently received burst of known data.

15. (canceled)